

WHAT IS CLAIMED IS:

1. A decorative structure comprising a substrate formed of fly ash in the form of ceramic balloons having a size of in the range of about 50 microns to about 500 microns thinly coated with in a bonding agent in a ratio that is configured to optimize strength and coefficient of thermal expansion and form an open cell structure of ceramic micro balloons on at least one outer surface of the substrate; and

a coating layer applied to said at least one outer surface having at least one of a coefficient of thermal expansion substantially equal to that of the substrate and a expansion characteristic configured to substantially absorb any difference in the coefficient of thermal expansions between the coating layer and substrate to substantially eliminate any physical deformation between the substrate and coating layer forming an exterior outer surface having a fabricated ornamental appearance.

2. The decorative structure of claim 1 wherein the ceramic micro balloons size range from about 50 microns to about 300 microns

3. The decorative structure of claim 2 wherein the ceramic micro balloons are about 200 microns.

4. The decorative structure of claim 1 wherein the bonding agent is selected from a group consisting of an amine cured epoxy resin, epoxy resin and thermal setting polymer.

5. The decorative structure of claim 1 wherein the bonding agent is a resin.

6. The decorative structure of claim 5 wherein the resin is an amine cured epoxy resin.

7. The decorative structure of claim 6 wherein the amine cured epoxy resin may comprise an amine cured Bisphenol-A based epoxy resin.

8. The decorative structure of claim 1 wherein the coating layer is configured of a coating material having a coefficient of thermal expansion substantially equal to that of the substrate.

9. The decorative structure of claim 1 wherein the coating layer is configured of a coating material and a treatment material which in combination have a coefficient of thermal expansion substantially equal to that of the substrate.

10. The decorative structure of claim 1 wherein the coating layer is configured of a coating material and a treatment material which in combination have a coefficient of thermal expansion substantially equal to that of the substrate.

11. The decorative structure of claim 1 wherein the coating layer is configured of a at least one of a coating material and a treatment material which in combination have a coefficient of thermal expansion substantially equal to that of the substrate and thin coating material finishing layer having an expansion characteristic configured to substantially absorb any difference in the coefficient of thermal expansions between the coating layer and substrate to substantially eliminate any physical deformation between the substrate and coating layer forming an exterior outer surface having a fabricated ornamental appearance.

12. The decorative structure of claim 1 wherein said substrate is configured to have density in the range of about 27 lbs/cu ft to about 30 lbs/cu ft.

13. The decorative structure of claim 1 wherein said substrate is configured to have crush strength of greater than 1500 psi.

14. The decorative structure of claim 1 wherein said substrate is configured to have flex strength of greater than 250 psi.

15. The decorative structure of claim 1 wherein said substrate is configured to have coefficient of thermal expansion in the range of about 6 ppm/inch/degreeF to about 7 ppm/inch/degreeF

16. The decorative structure of claim 1 wherein said substrate is configured to have a Thermal K of greater than 0.1 Watt/meter/K.

17. The decorative structure of claim 1 wherein said substrate is configured to have a the Glass Transition Temperature, T_g , of greater than 200 degree F

18. The decorative structure of claim 6 wherein said substrate comprises about 80% by weight to about 90% by weight of fly ash ceramic balloons and about 10% by weight to about 20% by weight of amine cured epoxy resin.

19. A decorative panel comprising
a substrate having a first surface and a second surface
formed of fly ash in the form of ceramic micro balloons having a

size in the range of about 50 microns to about 500 microns thinly coated with an amine cured epoxy resin in a ratio that is configured to optimize strength and coefficient of thermal expansion; and

a coating layer applied by capillary action to one of said first surface and said second surface of the substrate wherein said coating layer has at least one of a coefficient of thermal expansion substantially equal to that of the substrate and a expansion characteristic configured to substantially absorb any difference in the coefficient of thermal expansions between the coating layer and substrate to substantially eliminate any physical deformation between the substrate and coating layer forming an exterior outer surface having a fabricated ornamental appearance.

20. The decorative panel of claim 19 wherein the ceramic micro balloons size range from about 50 microns to about 300 microns.

21. The decorative panel of claim 20 wherein the ceramic micro have size of about 200 microns.

22. The decorative panel of claim 20 wherein the coating layer comprises a coating material and a coating treatment material which in combination have a coefficient of thermal expansion substantially equal to that of the substrate.

23. The decorative panel of claim 19 wherein said substrate is formed into a selected shape.

24. The decorative panel of claim 19 wherein said substrate comprises about 80% by weight to about 90% by weight of fly ash micro balloons and about 10% by weight to about 20% by weight of amine cured epoxy resin.

25. The decorative panel of claim 24 wherein said amine cured epoxy resin comprises an amine cured Bisphenol-A based epoxy resin.

26. The decorative panel of claim 24 wherein the ratio of ceramic micro balloons to an amine cured epoxy is configured to optimize at least one of a coefficient of thermal expansion in the range of about 6PPM/inch/degree F and 7PPM/inch/degree, a density of about 27 lbs/cu ft to about 30lbs/cu ft; a crush strength of >1500psi; a flex strength of >250psi and a Thermal K of about 0.1 Watt/meter/K and glass transition temperature Tg >200F.

27. The decorative panel of claim 19 wherein said coating layer has a pair of opposed surfaces and one of the pair of opposed surfaces is bonded to one of said first surface and said second surface of the substrate and the other of said of the pair of opposed surfaces defines an exterior outer surface having a fabricated ornamental appearance.

28. The decorative panel of claim 27 wherein said exterior outer surface is a simulated panel coating.

29. The decorative panel of claim 27 wherein said exterior outer surface is a faux finish.

30. The decorative panel of claim 27 wherein said exterior outer comprises a faux finish having a milled aggregate in a water based acrylic emulsion.

31. The decorative panel of claim 27 wherein said exterior outer comprises a faux finish fabricated from an Aronite brand coating material.

32. A chafing dish serving station comprising
a chafing dish supporting structure having a selected longitudinal dimension and a selected lateral dimension configured for forming a chafing dish receiving section for supporting a chafing dish above a burner placed below the chafing dish, said chafing dish support structure having a selected vertical height and a selected lineal outer length which entirely circumscribes said selected longitudinal dimension and said lateral dimension; and

a decorative shell structure having outer walls having a vertical height substantially equal to said selected vertical height and a lineal dimension substantially equal to elected lineal outer length so as to enclose said chafing dish structure and burner, said decorative shell structure comprising

a substrate formed of fly ash in the form of ceramic micro balloons having a in the range of about 50 microns to about 500 microns thinly coated with an amine cured epoxy resin in a ratio that is configured to optimize strength and coefficient of thermal expansion; and

a coating layer applied to said at least one outer surface having at least one of a coefficient of thermal expansion substantially equal to that of the substrate and a expansion characteristic configured to substantially absorb any difference in the coefficient of thermal expansions between the coating layer and substrate to substantially eliminate any physical deformation between the substrate and coating layer forming an exterior outer surface having a fabricated ornamental appearance.

33. The chafing dish serving station of claim 32 wherein said substrate has a first surface and a second surface formed of fly ash in the form of ceramic micro balloons having a size of about 200 micron thinly coated with an amine cured epoxy resin in a ratio that is configured to optimize strength and coefficient of thermal expansion, said coating having an exterior outer surface having a fabricated ornamental appearance.

34. A decorative shell for enclosing object comprising a substrate formed of fly ash in the form of ceramic balloons having a size of in the range of about 50 microns to about 500 microns thinly coated with in a bonding agent in a ratio that is configured to optimize strength and coefficient of thermal expansion and form an open cell structure of ceramic micro balloons on at least one outer surface of the substrate; and

a coating layer applied by capillary action to said at least one outer surface having at least one of a coefficient of thermal expansion substantially equal to that of the substrate and a expansion characteristic configured to substantially absorb any

difference in the coefficient of thermal expansions between the coating layer and substrate to substantially eliminate any physical deformation between the substrate and coating layer forming an exterior outer surface having a fabricated ornamental appearance.

35. The decorative shell for enclosing object of claim 34 wherein said substrate has a vertical height substantially equal to a selected vertical height of an object to be enclosed thereby and a lineal dimension substantially equal to a selected lineal dimension of an object to be enclosed thereby so as to enclose said object with said decorative shell.

36. The decorative shell for enclosing structure an object of claim 34 wherein said coating layer defines an exterior outer surface having a fabricated ornamental wherein said enclosed object has an appearance defined by said ornamental appearance.

37. An underlay for use as a component in a decorative structure, said underlay comprising

a substrate formed of fly ash in the form of ceramic balloons having a size of in the range of about 50 microns to about 500 microns thinly coated with a bonding agent in a ratio that is configured to optimize strength and coefficient of thermal expansion and to form an open cell structure of ceramic micro balloons on at least one outer surface of the substrate.

38. The underlay of claim 37 wherein said substrate has at least one outer surface further and further comprises

a coating layer adhering by capillary action to said at least one outer surface having at least one of a coefficient of thermal expansion substantially equal to that of the substrate and a expansion characteristic configured to substantially absorb any difference in the coefficient of thermal expansions between the coating layer and substrate to substantially eliminate any physical deformation between the substrate and coating layer forming an exterior outer surface having a fabricated ornamental appearance.

39. The underlay of claim 37 herein said coating layer has an exterior outer surface having a fabricated ornamental appearance.

40. The underlay of claim 39 herein said coating layer having an exterior outer surface having a fabricated ornamental appearance is fabricated as a protective, outer layer providing protection from environmental conditions.

41. The underlay of claim 37 wherein said substrate comprises about 80% by weight to about 90% by weight of fly ash ceramic micro balloons and about 10% by weight to about 20% by weight of an amine cured epoxy resin.

42. A method of forming a decorative comprising the steps of:

fabricating a substrate of fly ash in the form of ceramic micro balloons having a size in the range of about 50 microns to about 500 microns thinly coated with a bonding agent in a ratio that is configured to optimize strength and coefficient of thermal expansion and wherein said substrate has at least one outer surface having an open cell structure formed by the ceramic micro balloons in the bonding agent; and

applying to said open cell structure in the at least one outer surface of the substrate by capillary action a coating layer having at least one of a coefficient of thermal expansion substantially equal to that of the substrate and a expansion characteristic configured to substantially absorb any difference in the coefficient of thermal expansions between the coating layer and substrate to substantially eliminate any physical deformation between the substrate and coating layer forming an exterior outer surface having a fabricated ornamental appearance.

43. The method of claim 42 wherein the step of fabricating a substrate includes a substrate comprising about 80% by weight to about 90% by weight of fly ash ceramic micro balloons and about 10% by weight to about 20% by weight an amine cured epoxy resin.

44. The method of claim 42 wherein the step of fabricating a substrate includes making the substrate fire resistant.

45. The method of claim 42 wherein the step of applying to said outer surface includes using a coating layer having a

269 100803 5629 413454/030
coating treatment material having a milled aggregate in a water
based acrylic emulsion.

46. The method of claim 42 wherein the step of applying to
said outer surface includes using a coating layer that is a
simulated panel coating.

269 5629claim100803